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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/764,584

01/27/2004

Gerard Martin

PET-2121

8971

23599 7590 01/19/2007
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EXAMINER

DANG, THUAN D

ART UNIT

PAPER NUMBER

1764

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/764,584

Applicant(s)

MARTIN ET AL.

Examiner

Thuan D. Dang

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1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/27/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 10 is objected to because of the following informalities: it is unclear if the word "stream" is correctly typed or not. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9 and 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hallee (3,487,121) in view of Kendall (4,658,762).

Hallee discloses a process of steam cracking of hydrocarbons to produce a product containing both ethylene and propylene in a radiation zone comprising vertical exchange tube bundle inside of which the hydrocarbon is circulated for cracking. The feed in the tube is radiantly heated by burners on the walls of the furnace (the abstract; col. 1, lines 43-47; col. 2, lines 41-49 and 62-67; the figures).

Hallee discloses the temperatures in the radiation zone on column 5, line 70 thru column 6, line 2.

Hallee does not disclose that these burners are catalytic burners with porous panels and the ratio of the cumulative surface of the porous panels and the cumulative surface of the radiant walls of at least equal to 0.3. However, Kendall discloses using fiber catalytic radiant burners in an advanced heater used for heating hydrocarbon feeds and further the number of burners varies according to the specifications and requirements of particular application (the abstract; col. 1, lines 4-19; col. 2, lines 15-19 and 41-47).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Hallee process by using the Kendall fiber catalytic radiant burners as the burners in the Hallee radiation chamber to arrive at the applicants' claimed process since Hallee discloses that any kind of burner can be used (col. 8, lines 29-33) and Kendall discloses that the heater with the burners operates with reduced NO_x emissions, less

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noise, without post-combustion clean-up, and compact size when compared with conventional heater (col. 1, lines 11-54).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Hallee process modified with Kendall's burners by selecting an appropriate number of burners (area of porous panels) according to the applications to arrive at the applicants' claimed process. In the case, for example a cracking reaction is carried out, a larger cumulative area of burners must be used to meet the requirement of heat.

The NO_x level as called for in the claim must be inherent from the Hallee process modified by the Kendall's burners since both are operated in similar radiation chambers.

Kendall does not disclose the pore size of the porous layer of ceramic fibers. However, It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Hallee process modified by the Kendall burners by selecting an appropriate pore size for the porous layers to optimize the heat transfer.

Kendall does not disclose the combustion occurs "radiant" or "blue flame" mode as called for in claim 6 and 7. However, It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Hallee process modified by the Kendall burners by operating in any mode provided that these burners can supply enough heat for reactions.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hallee (3,487,121) in view of Kendall (4,658,762) further in view of Gargominy et al (3,475,135).

Hallee discloses a process as discussed above.

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Hallee does not disclose using his furnace modified by Kendall's burners for production of synthesis gas. However, Gargominy discloses that steam reforming of hydrocarbons for production of synthesis gas can be operated in furnace equipped with radiant burners (the abstract).

It would have been obvious to one having ordinary skill in the art who needs to produce syn gas at the time the invention was made to have modified the Hallee process modified by Kendall's burners by operating the syn-gas production Gargominy process in the Hallee furnace modified by Kendall's burners to arrive at the applicants' claimed process since the furnace of Hallee has elements such as heat exchange tubes and burners which makes endothermic reaction possible.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuan D. Dang whose telephone number is 571-272-1445. The examiner can normally be reached on Mon-Thu.

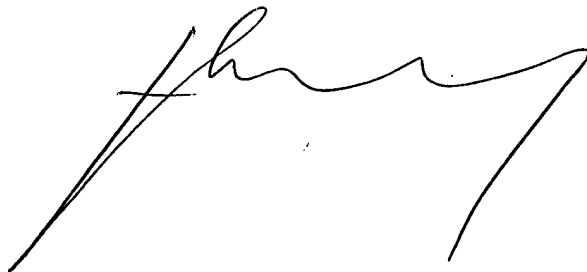
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thuan D. Dang
Primary Examiner
Art Unit 1764

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A handwritten signature in black ink, appearing to read 'Thuan D. Dang', is written over the printed name and title.